

# PATENT ABSTRACTS OF JAPAN

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(71)Applicant : MATSUSHITA ELECTRIC IND CO LTD

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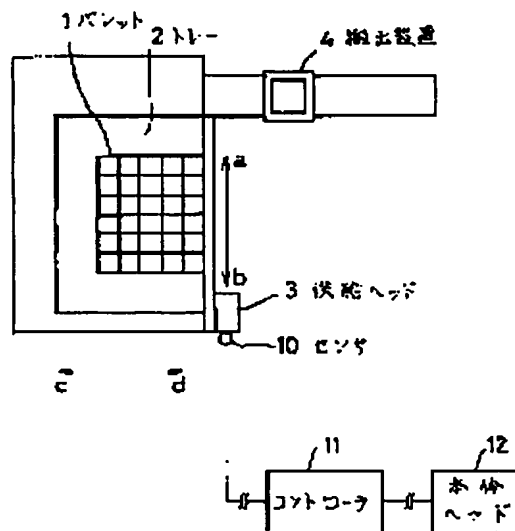
(72)Inventor : ODA YOSHIHIKO  
OBARA HIROSHI

## (54) CORRECTION METHOD OF MOUNTING FAILURE OF ELECTRONIC COMPONENT

### (57)Abstract:

**PURPOSE:** To eliminate a failure of a fixing method of a component installation container and a component arrangement direction in a supply device of a component by making a correction during attraction or mounting by detecting an angle of a component installation container (pallet) of a supply device of a component of an electronic component mounting device and an angle of a component.

**CONSTITUTION:** Four corners of a pallet 1 are searched by moving a tray 2 in directions of arrows (c), (d) and a supply head 3 attached with a sensor 10 in directions of arrows (a), (b). A crack of the pallet 1 is located, information is sent to a controller 11, a value thereof is subtracted from attraction or mounting angle of a part and correction is performed by rotation during attraction or mounting by a main head 12.



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**CLAIMS**

[Claim(s)]

[Claim 1]A mounting mistake correcting method of electronic parts distinguishing an installation direction of a part installation container by a sensor, and amending by a mistake angle at the time of adsorption of parts, or wearing based on information on an installation direction from said sensor.

[Claim 2]A mounting mistake correcting method of electronic parts distinguishing directions, such as a mark and a character, and amending by mistake rotation at the time of adsorption of parts, or wearing based on information on directions, such as a mark from said camera, and a character, by recognizing a mark, a character, etc. of parts with a camera.

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**DETAILED DESCRIPTION****[Detailed Description of the Invention]****[0001]**

**[Industrial Application]**This invention distinguishes a part for a part for a mistake angle, and mistake rotation at the time of the installation direction of the palette in an electronic component mounting machine, adsorption of parts, and wearing, and relates to the method of amending the mistake wearing normally.

**[0002]**

**[Description of the Prior Art]**Below, the distinction and the part supply mechanism of component orientation in the conventional electronic component mounting machine are explained.

**[0003]**Drawing 6 shows the flat-surface schematic illustration showing the composition of a part installation container (henceforth a palette), and there is a thing of various installed numbers and shape for every parts, and the palette 1 puts parts (figure abbreviation) on this, and installs them in a feed unit (figure abbreviation). The mark which shows a right installation direction is cutting to the corner of this palette 1, and it has 1a.

**[0004]**Drawing 7 shows the flat-surface schematic illustration of the part supply mechanism of an electronic component mounting machine, the palette 1 is fixed to the tray 2, and the tray 2 is pulled out in the direction of arrow c. Then, the nozzle (figure abbreviation) of the supply head 3 is adsorbed, and parts are carried in the direction of arrow b, and are placed by the carrying out device 4. This carrying out device 4 moves in the direction of arrow a, and the nozzle of the body head of an electronic component mounting machine (figure abbreviation) is adsorbed and equipped with it there.

**[0005]**The character in which drawing 8 shows the flat-surface schematic illustration of QFP in which electronic parts carry out an example, 5a was cut, a lead draws 6 on a package, 7 was drawn on it, and 8 was drawn on the package 6, and 9 are the marks 9 drawn on the package 6. QFP5 was generally cutting the component orientation of this QFP with the recognition camera, it looked at 5a, and has distinguished the direction of parts. There are some which have distinguished the direction because there is [ the upper part of the package 6 or ] a pattern (mark 9) caudad.

**[0006]**

**[Problem(s) to be Solved by the Invention]**However, when an operator supplies parts to a feed unit, the direction which arranges parts in a palette, and the installation direction of a palette may be mistaken. In that case, the problem equipped with parts in the wrong direction occurs. The method which parts (QFP) are cutting and distinguishes the direction by 5a as shown in drawing 8 has low accuracy because of the barricade of parts. Since the method of distinguishing by the upper and lower sides of the pattern (mark 9) of the package 6 differs in the position of the mark 9 or the character 8 by parts, it cannot respond.

**[0007]**This invention solves the above-mentioned conventional problem, and it aims at losing the mistake for the installation directions and part arrangement of the palette in the feed unit of parts by applying amendment in the case of adsorption or wearing.

**[0008]**

**[Means for Solving the Problem]**In order that this invention may solve an aforementioned problem, the 1st means distinguishes an installation direction of a part installation container (palette) by a sensor, and amends by a mistake angle at the time of adsorption of parts, or wearing based on information on an installation direction from said sensor.

**[0009]**By recognizing a mark, a character, etc. of parts with a camera, the 2nd means distinguishes

directions, such as a mark and a character, and amends by mistake rotation at the time of adsorption of parts, or wearing based on information on directions, such as a mark from said camera, and a character.

[0010]

[Function]The palette 1 shown in (1) drawing 6 is cutting with this invention, and the position of 1a is distinguished by a sensor by it.

Therefore, it can be distinguished how many times it is shifted, as are shown in drawing 1 and it is shown in (b), (c), and (d) from an original position (a).

[0011](2) As shown in drawing 2, it recognizes with a camera which positions (a) thru/or (d) that quadrisectioned the package 6 of parts the position of the mark 9 of parts is one of, and it inputs which position has a mark for every parts beforehand, and an angle is distinguished by comparing data.

[0012](3) An angle is distinguished by distinguishing the direction of the character (A) 8 of the package 6 of parts like drawing 3.

[0013]The above (1) If an angle or a rotated gap is distinguished by the method of - (3), and only the angle is lengthened from actual adsorption or a mounting angle, it will be correctly equipped with parts.

[0014]

[Example]Drawing 4 is a flat-surface schematic illustration of the part feeder which detects the position which the palette which enforces this invention method cuts. In drawing 4, the four corners (refer to drawing 1) of the palette 1 are searched with the tray 2 moving in the arrow c and the direction of d, and the supply head 3 which attached the sensor 10 moving in the arrow a and the direction of b, it is cutting with it, and the position of 1a is distinguished. That information is sent to the controller 11 and that value is lengthened from adsorption or the mounting angle of parts within this controller 11, and by the body head 12, it is made to rotate at the time of adsorption or wearing, and amends.

[0015]Drawing 5 is a flat-surface schematic illustration of the mechanism in which the mark 9 or the character 8 detects the angle of the parts which enforce this invention method. In drawing 5, the camera 13 which recognizes the substrate of the body head 12 of a mounting machine is connected to the recognition processing apparatus 14. When the body head 12 adsorbs the parts supplied by the carrying out device 4 like said drawing 4, parts are picturized with the substrate recognition camera 13. The data is processed with the recognition processing apparatus 14, from the mark 9 and character 8 which are shown in drawing 2 and drawing 3, a gap of the angle of parts is detected, it is made to rotate by the zipper 15 and the angle which lengthened the value from adsorption or the mounting angle of parts is amended.

[0016]

[Effect of the Invention]As explained above, even if this invention method makes a mistake in the fixing method and those for part arrangement of a part installation container (palette) of parts in an electronic component mounting machine, it becomes possible to apply amendment in the case of adsorption or wearing. [ of a feed unit ] Excellent article production mounting is realized by that.

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**TECHNICAL FIELD**

---

[Industrial Application]This invention distinguishes a part for a part for a mistake angle, and mistake rotation at the time of the installation direction of the palette in an electronic component mounting machine, adsorption of parts, and wearing, and relates to the method of amending the mistake wearing normally.

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**PRIOR ART**

[Description of the Prior Art]Below, the distinction and the part supply mechanism of component orientation in the conventional electronic component mounting machine are explained.

[0003]Drawing 6 shows the flat-surface schematic illustration showing the composition of a part installation container (henceforth a palette), and there is a thing of various installed numbers and shape for every parts, and the palette 1 puts parts (figure abbreviation) on this, and installs them in a feed unit (figure abbreviation). The mark which shows a right installation direction is cutting to the corner of this palette 1, and it has 1a.

[0004]Drawing 7 shows the flat-surface schematic illustration of the part supply mechanism of an electronic component mounting machine, the palette 1 is fixed to the tray 2, and the tray 2 is pulled out in the direction of arrow c. Then, the nozzle (figure abbreviation) of the supply head 3 is adsorbed, and parts are carried in the direction of arrow b, and are placed by the carrying out device 4. This carrying out device 4 moves in the direction of arrow a, and the nozzle of the body head of an electronic component mounting machine (figure abbreviation) is adsorbed and equipped with it there.

[0005]The character in which drawing 8 shows the flat-surface schematic illustration of QFP in which electronic parts carry out an example, 5a was cut, a lead draws 6 on a package, 7 was drawn on it, and 8 was drawn on the package 6, and 9 are the marks 9 drawn on the package 6. QFP5 was generally cutting the component orientation of this QFP with the recognition camera, it looked at 5a, and has distinguished the direction of parts. There are some which have distinguished the direction because there is [ the upper part of the package 6 or ] a pattern (mark 9) caudad.

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**EFFECT OF THE INVENTION**

[Effect of the Invention]As explained above, even if this invention method makes a mistake in the fixing method and those for part arrangement of a part installation container (palette) of parts in an electronic component mounting machine, it becomes possible to apply amendment in the case of adsorption or wearing. [ of a feed unit ] Excellent article production mounting is realized by that.

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**TECHNICAL PROBLEM**

[Problem(s) to be Solved by the Invention]However, when an operator supplies parts to a feed unit, the direction which arranges parts in a palette, and the installation direction of a palette may be mistaken. In that case, the problem equipped with parts in the wrong direction occurs. The method which parts (QFP) are cutting and distinguishes the direction by 5a as shown in drawing 8 has low accuracy because of the barricade of parts. Since the method of distinguishing by the upper and lower sides of the pattern (mark 9) of the package 6 differs in the position of the mark 9 or the character 8 by parts, it cannot respond.

[0007]This invention solves the above-mentioned conventional problem, and it aims at losing the mistake for the installation directions and part arrangement of the palette in the feed unit of parts by applying amendment in the case of adsorption or wearing.

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**MEANS**

[Means for Solving the Problem]In order that this invention may solve an aforementioned problem, the 1st means distinguishes an installation direction of a part installation container (palette) by a sensor, and amends by a mistake angle at the time of adsorption of parts, or wearing based on information on an installation direction from said sensor.

[0009]By recognizing a mark, a character, etc. of parts with a camera, the 2nd means distinguishes directions, such as a mark and a character, and amends by mistake rotation at the time of adsorption of parts, or wearing based on information on directions, such as a mark from said camera, and a character.

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**OPERATION**

[Function]The palette 1 shown in (1) drawing 6 is cutting with this invention, and the position of 1a is distinguished by a sensor by it.

Therefore, it can be distinguished how many times it is shifted, as are shown in drawing 1 and it is shown in (b), (c), and (d) from an original position (a).

[0011](2) As shown in drawing 2, it recognizes with a camera which positions (a) thru/or (d) that quadrisected the package 6 of parts the position of the mark 9 of parts is one of, and it inputs which position has a mark for every parts beforehand, and an angle is distinguished by comparing data.

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[0013]The above (1) If an angle or a rotated gap is distinguished by the method of - (3), and only the angle is lengthened from actual adsorption or a mounting angle, it will be correctly equipped with parts.

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**EXAMPLE**

[Example]Drawing 4 is a flat-surface schematic illustration of the part feeder which detects the position which the palette which enforces this invention method cuts. In drawing 4, the four corners (refer to drawing 1) of the palette 1 are searched with the tray 2 moving in the arrow c and the direction of d, and the supply head 3 which attached the sensor 10 moving in the arrow a and the direction of b, it is cutting with it, and the position of 1a is distinguished. That information is sent to the controller 11 and that value is lengthened from adsorption or the mounting angle of parts within this controller 11, and by the body head 12, it is made to rotate at the time of adsorption or wearing, and amends.

[0015]Drawing 5 is a flat-surface schematic illustration of the mechanism in which the mark 9 or the character 8 detects the angle of the parts which enforce this invention method. In drawing 5, the camera 13 which recognizes the substrate of the body head 12 of a mounting machine is connected to the recognition processing apparatus 14. When the body head 12 adsorbs the parts supplied by the carrying out device 4 like said drawing 4, parts are picturized with the substrate recognition camera 13. The data is processed with the recognition processing apparatus 14, from the mark 9 and character 8 which are shown in drawing 2 and drawing 3, a gap of the angle of parts is detected, it is made to rotate by the zipper 15 and the angle which lengthened the value from adsorption or the mounting angle of parts is amended.

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**DESCRIPTION OF DRAWINGS****[Brief Description of the Drawings]**

**[Drawing 1]**It is a flat-surface schematic illustration of the part installation container (palette) explaining an operation of this invention.

**[Drawing 2]**It is a flat-surface schematic illustration in the case of detecting the angle of the parts explaining an operation of this invention by a mark.

**[Drawing 3]**It is a flat-surface schematic illustration in the case of detecting the angle of the parts explaining an operation of this invention in written form.

**[Drawing 4]**It is a flat-surface schematic illustration of the part feeder which detects the position which the palette which enforces this invention method cuts.

**[Drawing 5]**It is a flat-surface schematic illustration of the mechanism in which a mark or a character detects the angle of the parts which enforce this invention method.

**[Drawing 6]**It is a flat-surface schematic illustration showing the composition of the part installation container (palette) in an electronic component mounting machine.

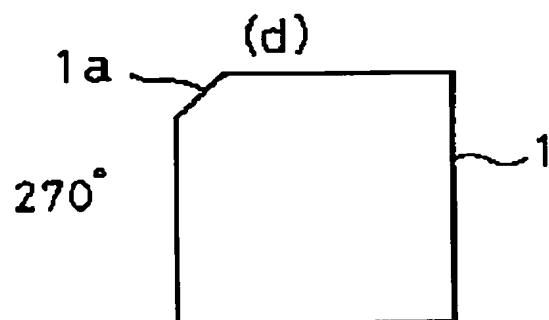
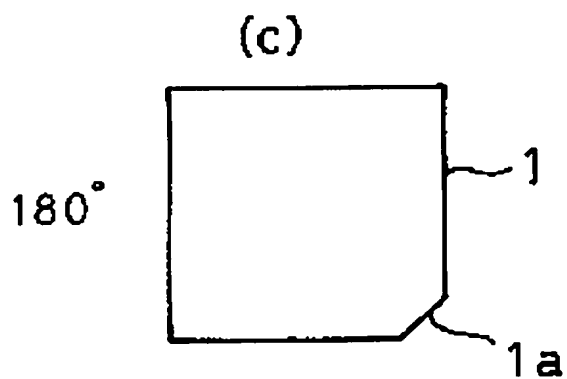
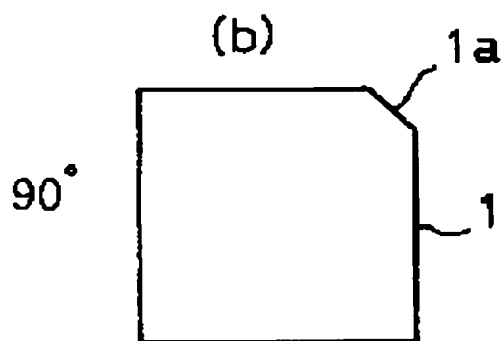
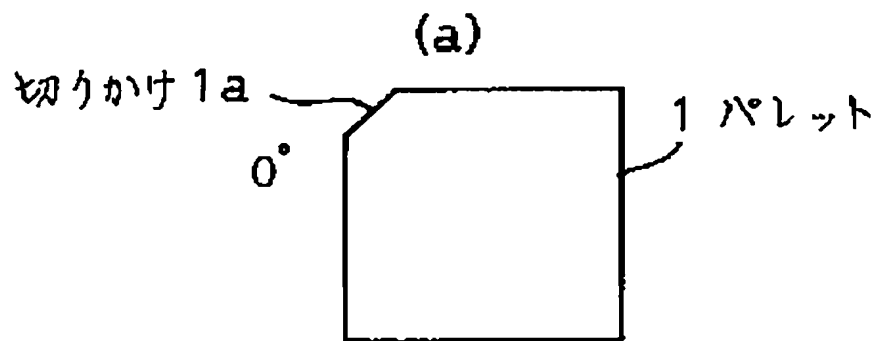
**[Drawing 7]**It is a flat-surface schematic illustration of the part feeder in an electronic component mounting machine.

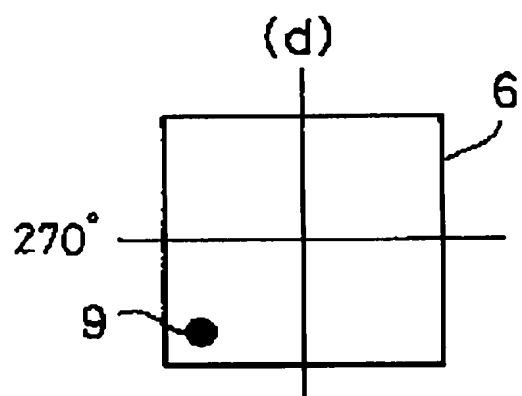
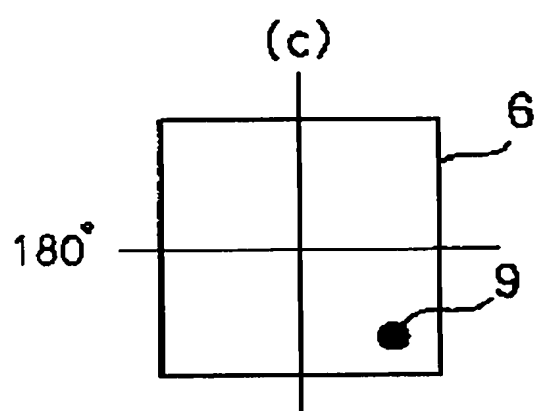
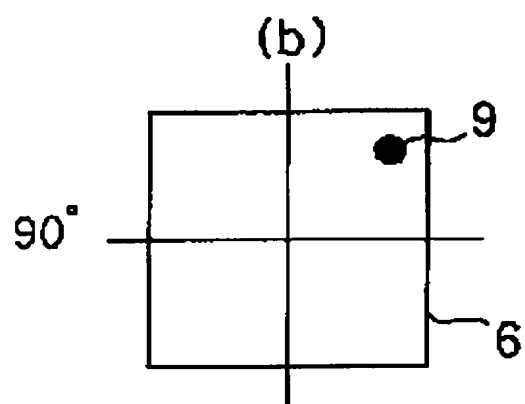
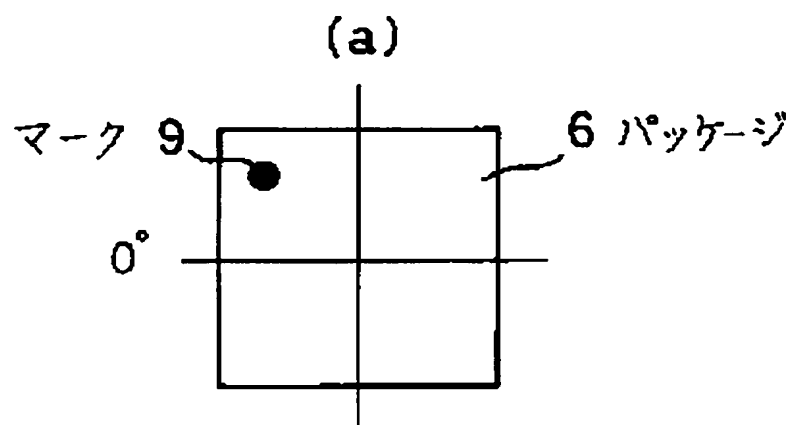
**[Drawing 8]**It is a flat-surface schematic illustration of QFP as an example of electronic parts.

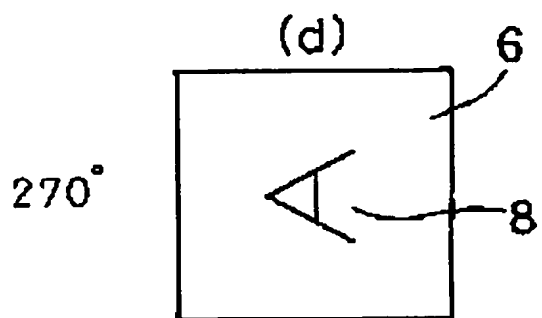
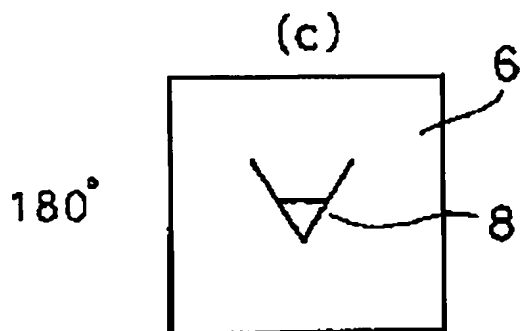
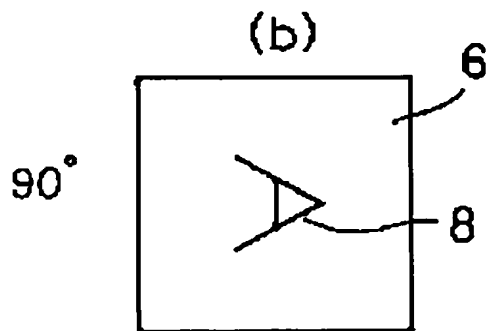
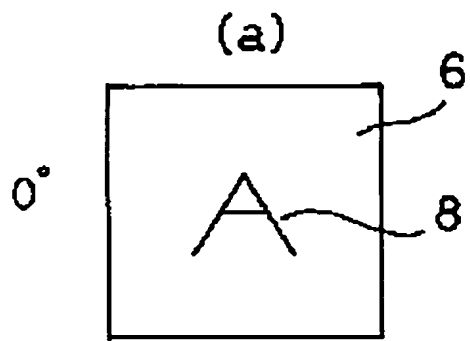
**[Description of Notations]**

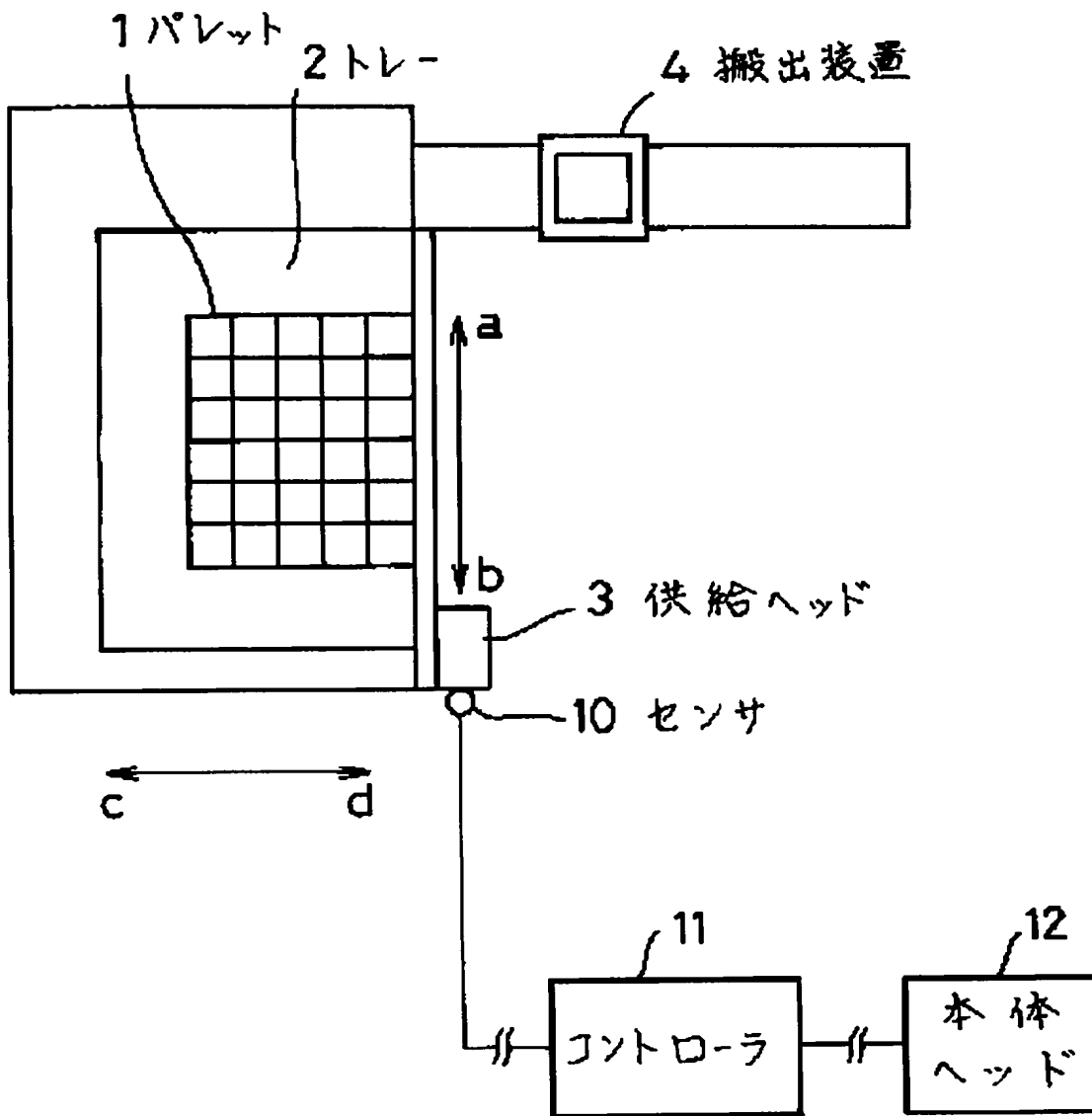
1 -- A part installation container (palette), and 1a, 5a -- It is 2 cutting. -- Tray, 3 [ -- A package and 7 / -- A lead, 8 / -- A character and 9 / -- A mark, 10 / -- A sensor and 11 / -- A controller and 12 / -- A body head and 13 / -- A substrate recognition camera and 14 / -- A recognition processing apparatus and 15 / -- Zipper. ] -- A supply head, 4 -- A carrying out device and 5 -- QFP, 6

**[Translation done.]**

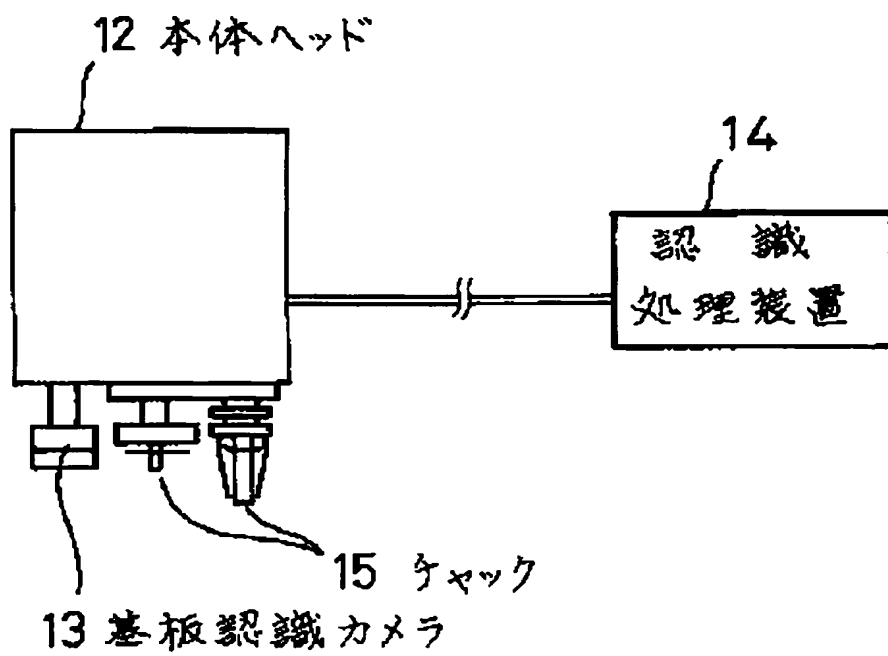






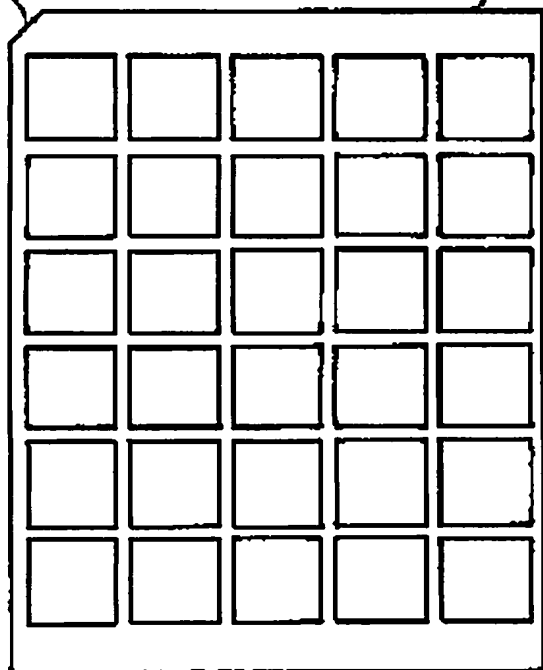


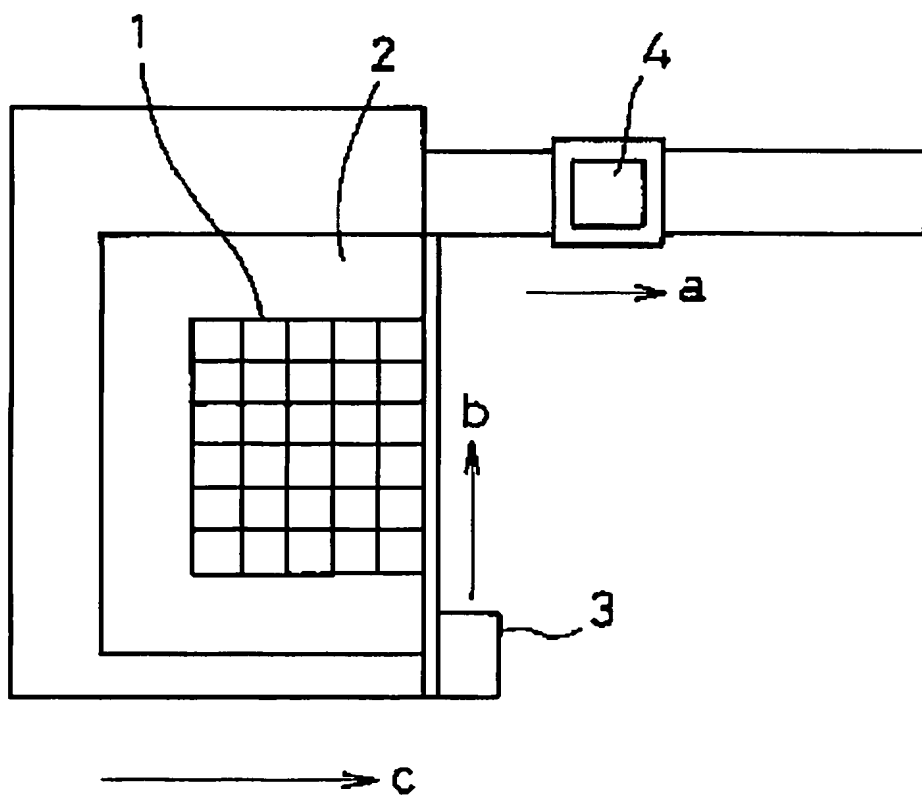


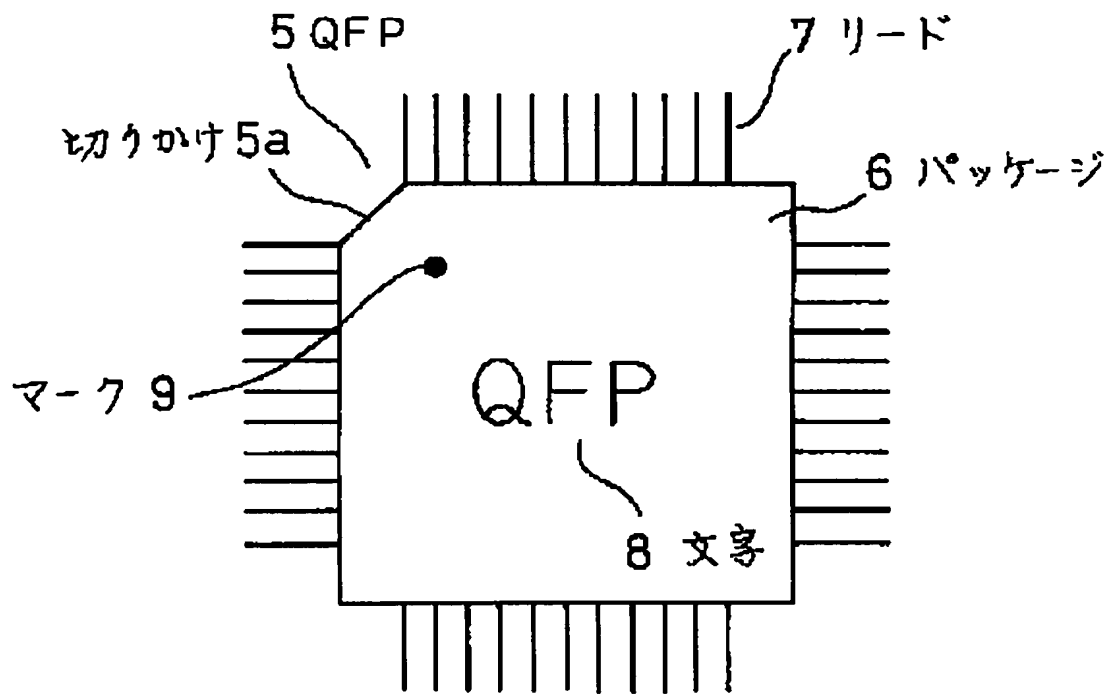


1a 切りかけ

1 パレット







(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号

特開平7-66595

(43)公開日 平成7年(1995)3月10日

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H 0 5 K 13/04	M			
G 0 5 B 19/404				
19/19	H	9064-3H		
G 0 5 D 3/12	L	9179-3H		
		9064-3H		
			G 0 5 B 19/ 18	H
			審査請求 未請求	請求項の数 2 O L (全 4 頁)

(21)出願番号 特願平5-216184

(22)出願日 平成5年(1993)8月31日

(71)出願人 000005821

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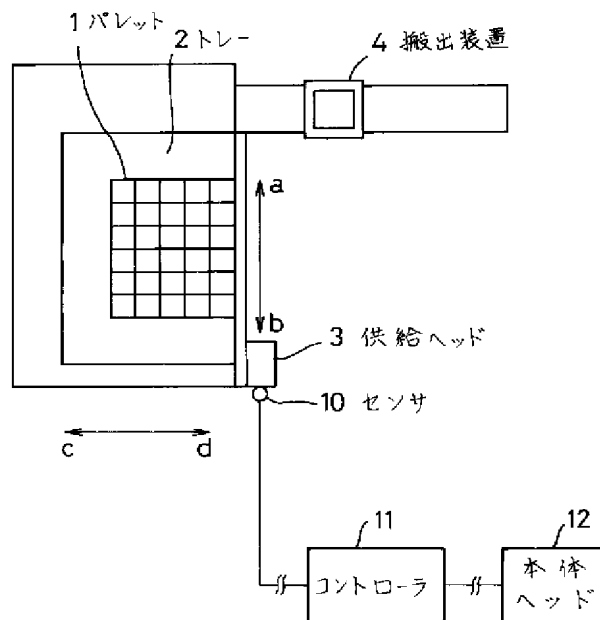
(74)代理人 弁理士 武田 元敏

(54)【発明の名称】 電子部品の装着ミス補正方法

(57)【要約】

【目的】 電子部品実装機の部品の供給装置の部品設置容器(パレット)の角度や部品の角度を検出して吸着または装着の際に補正をかけることで、部品の供給装置における部品設置容器の固定方法や部品並べ方向のミスをなくす。

【構成】 トレー2が矢印c, d方向へ移動し、センサ10を取り付けた供給ヘッド3が矢印a, b方向へ移動することで、パレット1の四隅を検索する。このパレット1の切りかけの位置を判別して情報をコントローラ11に送り、その値を部品の吸着もしくは装着角度から引いて、本体ヘッド12で吸着または装着時に回転して補正する。



**【特許請求の範囲】**

**【請求項1】** 部品設置容器の設置方向をセンサにより判別し、前記センサからの設置方向の情報を基に部品の吸着または装着時のミス角度分だけ補正を行うことを特徴とする電子部品の装着ミス補正方法。

**【請求項2】** カメラにより部品のマークや文字等を認識することによって、マークや文字等の方向を判別し、前記カメラからのマークや文字等の方向の情報を基に部品の吸着または装着時のミス回転分だけ補正を行うことを特徴とする電子部品の装着ミス補正方法。

**【発明の詳細な説明】****【0001】**

**【産業上の利用分野】** 本発明は電子部品実装機におけるパレットの設置方向や部品の吸着また装着時のミス角度分またはミス回転分を判別し、そのミス装着を正常に補正を行う方法に関する。

**【0002】**

**【従来の技術】** 以下に、従来の電子部品実装機における部品方向の判別と部品供給機構について説明する。

**【0003】** 図6は部品設置容器(以下、パレットという)の構成を示す平面略図を示し、パレット1は部品ごとに様々な設置数、形状のものがあり、これに部品(図略)をのせて供給装置(図略)に設置する。このパレット1の角部には正しい設置方向を示すマークの切りかけ1aを有する。

**【0004】** 図7は電子部品実装機の部品供給機構の平面略図を示し、パレット1はトレー2に固定され、トレー2が矢印c方向へ引き出される。そこで部品は供給ヘッド3のノズル(図略)に吸着され、矢印b方向へ運ばれ搬出装置4に置かれる。この搬出装置4が矢印a方向へ移動し、そこで電子部品実装機(図略)の本体ヘッドのノズルに吸着され、装着される。

**【0005】** 図8は電子部品の例としてのQFPの平面略図を示し、5aは切りかけ、6はパッケージ、7はリード、8はパッケージ6上に画かれた文字、9はパッケージ6上に画かれたマーク9である。このQFPの部品方向は、一般的に認識カメラでQFP5の切りかけ5aを見て部品の方向を判別している。また、パッケージ6の上方か下方に模様(マーク9)があることで方向を判別しているものもある。

**【0006】**

**【発明が解決しようとする課題】** しかしながら、オペレータが供給装置に部品を供給する際に、パレットに部品を並べる方向やパレットの設置方向を間違えることがある。その場合、間違った方向で部品が装着されてしまう問題が発生する。また、図8に示すように部品(QFP)の切りかけ5aでその方向を判別する方法は、部品のバリのため精度が低い。また、パッケージ6の模様(マーク9)の上下で判別する方法は、マーク9や文字8の位置が部品によって異なるため、対応しきれない。

**【0007】** 本発明は上記従来の問題を解決するもので、部品の供給装置におけるパレットの設置方向や部品並べ方向のミスを、吸着または装着の際に補正をかけることでなくすことを目的とする。

**【0008】**

**【課題を解決するための手段】** 本発明は上記課題を解決するため、第1の手段は、部品設置容器(パレット)の設置方向をセンサにより判別し、前記センサからの設置方向の情報を基に部品の吸着または装着時のミス角度分だけ補正を行うことを特徴とする。

**【0009】** 第2の手段は、カメラにより部品のマークや文字等を認識することによって、マークや文字等の方向を判別し、前記カメラからのマークや文字等の方向の情報を基に部品の吸着または装着時のミス回転分だけ補正を行うことを特徴とする。

**【0010】**

**【作用】** 本発明によれば、(1) 図6に示すパレット1の切りかけ1aの位置をセンサで判別することにより、図1に示すように本来の位置(a)より(b), (c), (d)に示すように何度ずれているか判別できる。

**【0011】** (2) 図2に示すように部品のマーク9の位置が部品のパッケージ6を4分割したどの位置(a)ないし(d)にあるかをカメラで認識し、予め部品ごとにどの位置にマークがあるかを入力し、データを比較することで角度が判別される。

**【0012】** (3) 図3のように部品のパッケージ6の文字(A)8の方向を判別することで、角度が判別される。

**【0013】** 上記(1)～(3)の方法で角度もしくは回転分のずれが判別されれば、実際の吸着または装着角度からその角度だけ引けば正しく部品が装着される。

**【0014】**

**【実施例】** 図4は本発明方法を実施するパレットの切りかけの位置を検出する部品供給装置の平面略図である。図4において、トレー2が矢印c, d方向へ移動し、センサ10を取り付けた供給ヘッド3が矢印a, b方向へ移動することで、パレット1の四隅(図1参照)を検索し、切りかけ1aの位置が判別される。その情報をコントローラ11に送り、このコントローラ11内でその値を部品の吸着もしくは装着角度から引いて、本体ヘッド12で吸着または装着時に回転させ補正する。

**【0015】** 図5は本発明方法を実施する部品の角度をマーク9もしくは文字8で検出する機構の平面略図である。図5において、実装機の本体ヘッド12の基板を認識するカメラ13は認識処理装置14に接続されている。前記図4のような搬出装置4により供給される部品を本体ヘッド12が吸着するときに、基板認識カメラ13で部品を撮像する。そのデータを認識処理装置14で処理し、図2, 図3に示すそのマーク9や文字8より部品の角度のずれを検出し、その値を部品の吸着もしくは装着角度から引いた角度をチャック15で回転させ補正する。

## 【0016】

【発明の効果】以上説明したように本発明方法は、電子部品実装機における部品の供給装置の部品設置容器(パレット)の固定方法や部品並べ方向をミスしても、吸着または装着の際に補正をかけることが可能となる。そのことにより良品生産実装が実現される。

## 【図面の簡単な説明】

【図1】本発明の作用を説明する部品設置容器(パレット)の平面略図である。

【図2】本発明の作用を説明する部品の角度をマークで検出する場合の平面略図である。

【図3】本発明の作用を説明する部品の角度を文字で検出する場合の平面略図である。

【図4】本発明方法を実施するパレットの切りかけの位置を検出する部品供給装置の平面略図である。

【図5】本発明方法を実施する部品の角度をマークまたは文字で検出する機構の平面略図である。

【図6】電子部品実装機における部品設置容器(パレット)の構成を示す平面略図である。

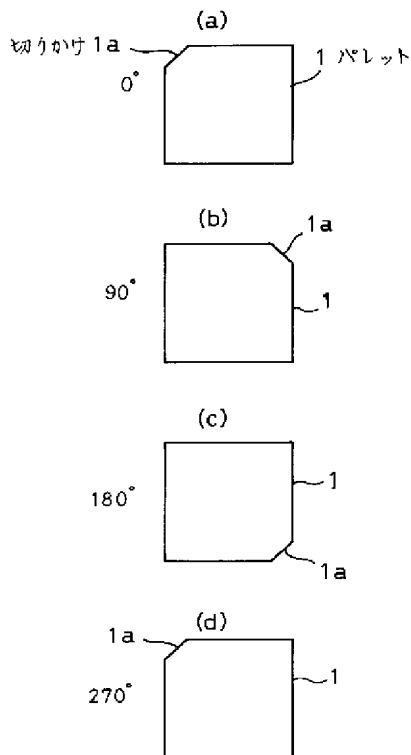
【図7】電子部品実装機における部品供給装置の平面略図である。

【図8】電子部品の例としてのQFPの平面略図である。

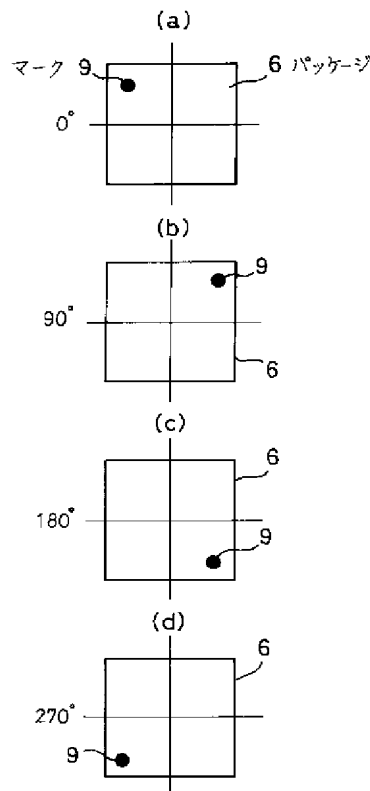
## 【符号の説明】

1…部品設置容器(パレット)、 1a、5a…切りかけ、  
2…トレイ、 3…供給ヘッド、 4…搬出装置、  
5…QFP、 6…パッケージ、 7…リード、8…文字、  
9…マーク、 10…センサ、 11…コントローラ、 12…本体ヘッド、 13…基板認識カメラ、 14…認識処理装置、 15…チャック。

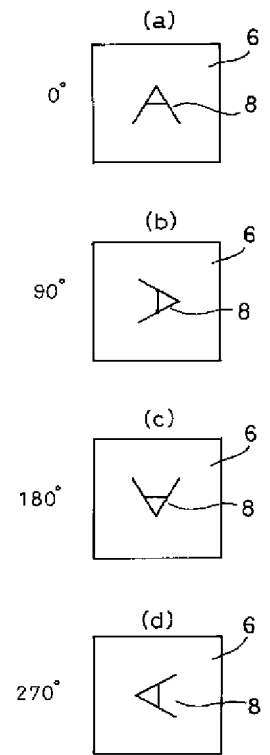
【図1】



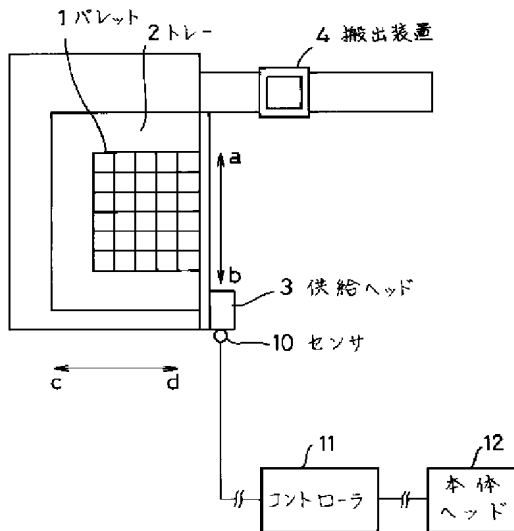
【図2】



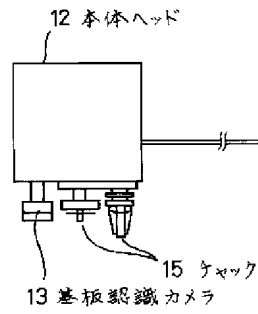
【図3】



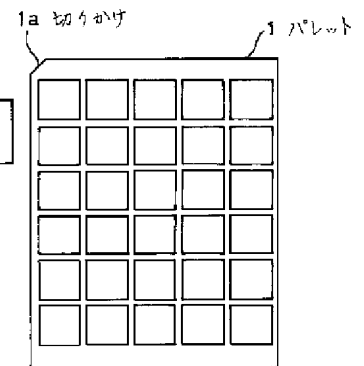
【図4】



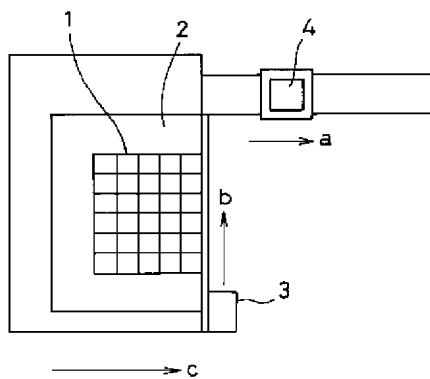
【図5】



【図6】



【図7】



【図8】

